

## PATENT ABSTRACTS OF JAPAN

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## (54) PIEZOELECTRIC THIN-FILM RESONATOR

## (57)Abstract:

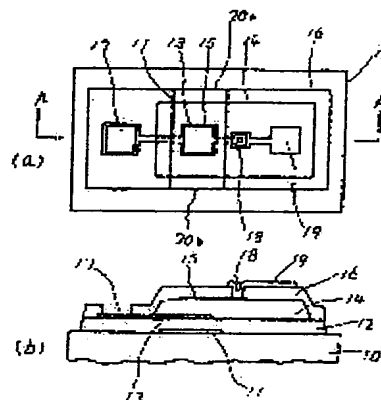
**PURPOSE:** To prevent stripping-off and damage of the electrode of the title resonator at the time of bonding and using a probe by forming an Au electrode layer contacted with a ZnO film and an electrode pad on a dielectric substance film separately from the Au electrode layer.

**CONSTITUTION:** A piezo-electric thin film 14 is formed by using ZnO, AlN, Ta<sub>2</sub>O<sub>5</sub>, PbTiO<sub>3</sub>, etc., and the 2nd dielectric substance film 16 is formed by using SiO<sub>2</sub>, Si<sub>3</sub>N<sub>4</sub>, etc. The film 16 improves the reliability of the film 14, a lower electrode 13, upper electrode 15 as their protecting film together with the 1st dielectric substance film 12 and, simultaneously, operates as

composite vibrator of a three-layer structure in which the film 14 is held between the dielectric substance films 12 and 16 with its vibrating section. A lower electrode pad section 17 is formed by etching part of the film 16 and, simultaneously, a contact hole 18 is formed at part

of the upper electrode 15 other than the vibrating section. When an Au film only is used for the upper electrode 15, the contact hole 18 can be formed accurately, since Au is strong against

and is not attacked by the etching agent. Then an upper electrode pad 19 is formed by forming a metallic film on the film 16 by vacuum deposition or sputtering.



## LEGAL STATUS

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